

And further, if the Comb be here made use of, by whose Teeth the Colours at the Image PT may be successively intercepted; the Spectrum S when the Comb is moved slowly will be perpetually tinged with successive Colours: But when by accelerating the motion of the Comb, the succession of the Colours is so quick that they cannot be severally seen, that Spectrum S, by a confused and mixt sensation of them all, will appear white.

EXPER. XII.

Fig. 9. The Sun shining through a large Prism ABC upon a Comb XY, placed immediately behind the Prism, his Light which passed through the interstices of the Teeth fell upon a white Paper DE. The breadths of the Teeth were equal to their interstices, and seven Teeth together with their interstices took up an Inch in breadth. Now when the Paper was about two or three Inches distant from the Comb, the Light which passed through its several interstices painted so many ranges of Colours kl, mn, op, qr, &c. which were parallel to one another and contiguous, and without any mixture of white. And these ranges of Colours, if the Comb was moved continually up and down with a reciprocal motion, ascended and descended in the Paper, and when the motion of the Comb was so quick, that the Colours could not be distinguished from one another, the whole Paper by their confusion and mixture in the Sensorium appeared white.

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Let the Comb now rest, and let the Paper be removed further from the Prism, and the several ranges of Colours will be dilated and expanded into one another more and more, and by mixing their Colours will dilute one another, and at length, when the distance of the Paper from the Comb is about a Foot, or a little more (suppose in the place 2 D 2 E) they will so far dilute one another as to become white.

With any Obstacle let all the Light be now stopt which passes through any one interval of the Teeth, so that the range of Colours which comes from thence may be taken away, and you will see the Light of the rest of the ranges to be expanded into the place of the range taken away, and there to be coloured. Let the intercepted range pass on as before, and its Colours falling upon the Colours of the other ranges, and mixing with them, will restore the whiteness.

Let the Paper 2 D 2 E be now very much inclined to the rays, so that the most refrangible rays may be more copiously reflected than the rest, and the white Colour of the Paper through the excess of those rays will be changed into blue and violet. Let the Paper be as much inclined the contrary way, that the least refrangible rays may be now more copiously reflected than the rest, and by their excess the whiteness will be changed into yellow and red. The several rays therefore in that white Light do retain their colorific qualities, by which those of any sort, when-ever they become more copious than the rest, do by their excess and predominance cause their proper Colour to appear.

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